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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,648	09/08/2003	Jeffry S. Schepp	064441.0285	2837
31625	7590	02/02/2005	EXAMINER	
BAKER BOTTS L.L.P. PATENT DEPARTMENT 98 SAN JACINTO BLVD., SUITE 1500 AUSTIN, TX 78701-4039			LIN, SUN J	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 02/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/657,648

Applicant(s)

SCHEPP ET AL.

Examiner

Sun J Lin

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09/08/2003 and 10/15/2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 27-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 27-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/15/03</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This office action is in response to application 10/657,648 filed on 09/08/2003 and *Preliminary Amendment* filed on 10/15/2003. According to the *Preliminary Amendment*, Claims 1 – 26 originally filed on 09/08/2003 have been cancelled, and Claims 27 – 53 have newly been added. Claims 27 – 53 remain pending in the application.

#### ***Specification Objections***

2. The specification is objected to because of following informalities:

Page 6, line 29, change "120" to **—121—**.

Page 7, line 22, after "designs" insert **—of—**.

Appropriate correction is required.

#### ***Drawing Objections***

3. Drawing listed below is objected to because of following informalities:

Fig. 5 should include reference numerical **"50"** to indicate a **"Pattern Data Screen"** as described in the specification (page 11, line 21).

Fig. 5, change "patent application" to **—pattern application—**.

Appropriate correction is required.

#### ***Claim Objections***

4. Claims listed below are objected to because of the following informalities:

Claim 27, line 1 – 2, before " photomask manufacturing equipment" insert **—a—**.

Claim 27, line 5, before "customer" insert **—remote—**.

Claim 27, line 11, before "design data" insert **—the—**.

Claim 28, line 2, before "customer" insert **—remote—**.

Claim 28, line 2, change "electronic form" to **—an electronic format—**.

Claim 30, line 2, before "data storage" insert **—a—**.

Claim 31, line 2, before "data storage" insert **—a—**.

Claim 35, line 1 – 2, before " photomask manufacturing equipment" insert **—a—**.

Claim 35, line 6, before "customer" insert **—remote—**.

Claim 35, line 11, change "instruction" to **—instructions—**.

- Claim 36, line 2, before "customer" insert ~~—remote—~~.
- Claim 38, line 2, before "data storage" insert ~~—a—~~.
- Claim 39, line 2, before "data storage" insert ~~—a—~~.
- Claim 42, line 2, before " photomask manufacturing equipment" insert ~~—a—~~.
- Claim 45, line 1, change "Claim 42" to ~~—Claim 43—~~.
- Claim 45, line 2, before "file" insert ~~—a—~~.
- Claim 46, line 1 – 2, change "fractured pattern data" to ~~—fracture instructions—~~.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- (1). Determining the scope and contents of the prior art.
- (2). Ascertaining the differences between the prior art and the claims at issue.
- (3). Resolving the level of ordinary skill in the pertinent art.
- (4). Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicants submitted IDS entitled "*Precision Online Ordering of Photoplots & Photomasks*" (June 2000) by PHOTOPLOT STORE (called PhotoStore hereinafter) in view of U.S. Patent No. 6,330,708 B1 to Parker et al.

7. As to Claim 53, PhotoStore shows and teaches the following subject matter:

- Online Request for Quotation & Mask Order Form (Photomasks & Larger Area Masks" – [Page 1, 5 – 10]; Supplied (photomask) Data Specifications (i.e., Photomask specification data) – [Page 5 – 6]; Notice that (1) the Supplied (photomask) Data Specifications (Photomask specification data) are formed in

an electronic format to be transmitted online from a customer computer through an Internet to a computer at the PHOTO PLOT STORE site (2) once received, the Photomask specification data is automatically stored in a database (i.e., data storage) at the PHOTO PLOT STORE site to be retrieval for use in photomask manufacture.

PhotoStore shows and teaches the subject matter listed above, it does not teach subject matter regarding generating a job deck for photomask writing tools based on the photomask specification data. But Parker et al. show and teach this subject matter as listed below:

- Photomask design data formed in a readable GDS II format – [abstract; Fig. 1; Fig. 2; col. 2, line 59 – col. 3, line 3]; (Photomask) design specification (data) – [col. 1, line 22]; Database – [col. 5, line 32]; Notice that the photomask design data and design specification data are stored in a database;
- (Photomask) design specification (data) being applied in defining photomask structure details (algorithm 19) for use in processing of manufacturing integrated circuit masks – [Fig. 1; col. 1, line 10 – 24];
- Generating a Job Deck for specific electron beam exposure tools (i.e., photomask writing tools) based on specific (Photomask) design specification data – [col. 1, line 10 – 24];
- Shapes of (photo)mask are measured during manufacture to determine whether they meet the (photomask design) specifications set forth **in the order**... The critical dimensions and tolerance of those dimensions (i.e., photomask design specifications) are provided in a database (i.e., data storage) as an input 16 – [Fig. 1; col. 3, line 4 – 7];
- (Photomask design) specifications define photomask structural details – [col. 1, line 22 – 24].

Parker et al. also teach that the Job Deck is generated based on the photomask specification data in order to achieve suitable instructions for use in electron beam exposure tools (photomask writing tools) provided in any particular semiconductor processes and vendors equipment – [col. 1, line 10 – 24].

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have applied the teachings of Parker et al. in generating the Job Deck based on the photomask specification data in order to achieve suitable instructions for use in electron beam exposure tools (photomask writing tools) provided in any particular semiconductor processes and vendors equipment.

8. Claims 27 – 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants submitted IDS entitled “Precision Online Ordering of Photoplots & Photomasks” (June 2000) by PHOTOPLOT STORE (called PhotoStore hereinafter) and U.S. Patent No. 6,330,708 B1 to Parker et al. in view of U.S. Patent No. 5,553,274 to Liebmann.

9. As to Claim 27, PhotoStore shows and teaches the following subject matter:

- Online Request for Quotation & Mask Order Form (Photomasks & Larger Area Masks” – [Page 1, 5 – 10];
- Supplied (Photomask) Data (i.e., photomask design data) and Supplied (photomask) Data Specifications (i.e., Photomask specification data) – [Page 5 – 6]; Notice that (1) the Photomask specification data and (pattern) design data are formed in an electronic format to be transmitted online from a customer computer through an Internet to a computer at the PHOTOPLOT STORE site (2) once received, the Photomask specification data (Supplied Data Specifications) and design data (supplied data) are automatically stored in a database (i.e., data storage) at the PHOTOPLOT STORE site to be retrieval for use in photomask manufacture;
- Fracture window specified in the Photomask specification data – [Page 6].

PhotoStore shows and teaches the subject matter listed above, it does not teach subject matter regarding utilizing a command generator to generate fracturing instructions and control instructions based on the photomask specification data. But Parker et al. show and teach this subject matter as listed below:

- Command files for photomask production – [title; Fig. 1; col. 2, line 36 – 48]; Notice that command files are generated by a command generator;
- (Photomask) design data formed in a readable GDS II format – [abstract; Fig. 1; Fig. 2; col. 2, line 59 – col. 3, line 3]; Notice that the (photomask) design data are

stored in a database (e.g., called customer design database) for future photomask manufacturing process based on query and/or priority of the photomask order received;

- Photomask) design specification (data) – [col. 1, line 22]; Shapes of (photo)mask are measured during manufacture to determine whether they meet the (photomask design) specifications set forth **in the order**... The critical dimensions and tolerance of those dimensions (i.e., photomask design specifications) are provided in a database (e.g., called specification database) as an input 16 – [Fig. 1; col. 3, line 4 – 7];
- (Photomask) design specification (data) being applied in defining photomask structure details (algorithm 19) for use in processing of manufacturing integrated circuit masks – [Fig. 1; col. 1, line 10 – 24];
- Combining the algorithm (i.e., design specification data) with information about input (design) data to provide control instructions to control Computer Aided Transcription System (CATS) to produce **pattern data** of a photomask – [col. 1, line 30 – 34];
- Fracturing manipulation software – [col. 1, line 25 – 26]; Job Deck Builder 44 (i.e., command generator) generating a Job Deck 45 (i.e., fracture instructions and control instructions) for specific electron beam exposure tools (i.e., photomask writing tools) based on specific (Photomask) design specification data – [col. 1, line 10 – 24; Fig. 2].

Parker et al. also teach that the Job Deck Builder (command generator) in communication with photomask specification data stored in a database to generate Job Deck (fracture instructions and control instructions) based on the photomask specification data in order to achieve **suitable instructions** for use in **electron beam exposure tools (photomask writing tools)** equipped with any particular semiconductor processes and vendors equipment utilized in photomask fabrication – [col. 1, line 10 – 24].

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have applied the teachings of Parker et al. in applying a command generator (Job Deck Builder) in communication with photomask specification data stored in a database to generate fracture instructions and control instructions (Job Deck) based on the photomask specification data in order to achieve

suitable instructions for use in photomask writing tools (electron beam exposure tools) equipped with any particular semiconductor processes and vendors equipment utilized in photomask fabrication.

PhotoStore and Parker et al. teach all subject matter given above; they do not teach a subject matter of utilizing a fracture engine that uses the fracture instructions and the design data to generate fractured pattern data. But Liebmann shows and teaches this subject matter as listed below:

- Applying a shapes process means (i.e., fracture engine) in a workstation that uses the fracture instructions to perform fracturing process/procedure based on original design data to generate fractured design data (i.e., fractured pattern data) – [col. 6, line 39 – 49; col. 6, line 61 – col. 8, line 14; abstract; Fig. 15];
- Fracturing original pattern into basic rectangles ... select those rectangles created in the fracturing procedures which is subject to OPC... original CAD (design) data is subject to the fracturing procedure – [abstract; col. 5, line 47 – col. 6, line 33].

Liebmann also teaches that, through fracturing process, original CAD (photomask) design data is fractured into a plurality of basic rectangles (i.e., fractured pattern data) to be sorted according to width in order to determine rectangles which require OPC bias to reduce number of non-necessary OPC thereby improving the efficiency (i.e., cost to benefit ratio) of the OPC process – [abstract; col. 2, line 53 – 55; col. 3, line 9 – 30].

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have applied the teachings of Liebmann in utilizing a fracture engine (shapes process means) in fracturing original CAD (photomask) design data into a plurality of basic rectangles (fractured pattern data) to be sorted according to width in order to determine rectangles which require OPC bias to reduce number of non-necessary OPC thereby improving the efficiency (i.e., cost to benefit ratio) of the OPC process.

For reference purposes, the explanations given above in response to Claim 27 are called **[Response A]** hereinafter.



10. As to Claim 35, reasons are included in **[Response A]** given above.

11. As to Claim 42, in addition to reasons included in **[Response A]** given above, Parker et al. show and teach the following subject matter:

- Generating equipment instructions from the fracture instructions (Job Deck) and electronically transmitted the equipment instructions for photomask processing 30 by photomask manufacturing equipment – [Parker et al.: Fig. 1; Fig. 2].

12. As to Claims 28, 29, 36, 37 and 43, during online photomask ordering, the computer operable to receive the design data from the remote customer computer through an Internet in a form-based electronic format. Notice that an Interconnect connection is a single network connection.

13. As to Claims 30 and 38, Parker et al. teach the following subject matter:

- CATS Include Files for use in processing of manufacturing integrated circuit photomask... CATS Include Files are passed to the CATS executing software which contains control instructions for use in performing the operation and producing the pattern data of photomask – [col. 1, line 11 – 38]; Notice that, before processing, the control instructions(CATS executing software) are delivered to a data storage (e.g., RAM and/or ROM) accessible by the photomask manufacturing equipment.

14. As to Claims 31 and 39, fractured pattern data (i.e., basics rectangles) are sorted and stored in a data storage (i.e., RAM and/or ROM) accessible by the photomask manufacturing equipment for performing necessary OPC.

15. As to Claims 32 and 40, reasons are included in **[Response A]** given above.

16. As to Claim 33, online photomask order through an Internet system can be realized on a local area network that includes the computer and the database.

17. As to Claims 34 and 41, reasons are included in **[Response A]** given above.

18. As to Claim 44, Liebmann teaches that the manufacturing of semiconductor devices is dependent the accurate replication of CAD generated pattern design data – [col. 1, line 20 – 23]. Notice that, in order to achieve desired circuit functionality, the pattern design data should comprise customer circuit design data.

19. As to Claim 45, during online photomask ordering, in order to receive error free pattern design data from the customer computer through an Internet, the pattern design data should be formatted and transmitted using an appropriate file transfer protocol compatible to the Internet connection utilized.

20. As to Claims 46 and 47, subject matter regarding fracture engine is included in [Response A] given above.

21. As to Claim 48, in addition to reasons included in [Response A] given above, Parker et al. teach that Job Deck Builder generates Job Deck to identify the location and type of quality assurance patterns and other structures to be written to the photomask – [Fig. 2; col. 4, line 22 – 40].

22. As to Claims 49 and 50, in addition to reasons included in [Response A] given above, Liebmann teaches (1) shapes processor means (i.e., fracture engine) – [col. 6, line 61 – col. 8, line 14] (2) fracturing procedure – [col. 5, line 61 – col. 6, line 50] (3) fractured pattern data – [col. 6, line 26 – 27]. Notice that the equipment instructions comprise (1) control instructions applied by the fracture machine (shapes processor means) and (2) fractured pattern data generated by the fracture machine. Notice that that (1) a fractured pattern data of an integrated circuit contain many layers – [Liebmann: Fig. 14] (2) the equipment instructions are used by the photomask manufacturing equipment to produce photomask patterns (for each layer) of an integrated circuit – [Parker et al.; title; col. 1, line 11].

23. As to Claim 51, in addition to reasons included in [Response A] given above, Parker et al. show and teach the following subject matter:

- Fracturing manipulation – [*Parker et al.*: col. 1, line 25 – 29];
- Electronically transmitting *Job Deck (equipment instructions)* to a processing equipment (i.e., *photomask manufacturing equipment*) – [Fig. 1];
- *Layout for photomask* is created from (fractured) *pattern files* (Moving Electron Beam Exposure MEBES data file) – [col. 1, line 17 – 19]; *mask creating tools* use (fractured) pattern data – [Fig. 1]; *Job Deck* uses MEBES to identify the location and type of patterns and other structures to be *written* to the photomask – [col. 4, line 33 – 40]; Notice that *mask creating tools* are *photomask writing tools*.

### **Conclusion**

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sun J Lin whose telephone number is (571) 272 - 1899. The examiner can normally be reached on Monday-Friday 9:30AM - 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on (571) 272 - 1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sun James Lin  
Patent Examiner  
Art Unit 2825  
January 31, 2005

